

CONCLUSION

Our principal conclusions are these:

(1) It may become necessary to try to limit atmospheric CO₂ concentration to a level which is probably less than 800 ppmv and may be as low as 500 ppmv.

(2) If atmospheric CO₂ concentration is to be kept below 500–800 ppmv, the use of fossil fuels should peak and start to decline within the next several decades, possibly as early as 2010 and probably by 2040 (Fig. 5). If this does not happen anyway, for reasons unrelated to CO₂, then explicit actions to retard fossil-fuel use would need to become effective within the next few decades (Fig. 8).

(3) In addition, if future global energy demand lies in the range defined by the IIASA Low and High Scenarios, the contribution of non-fossil energy sources would have to increase rapidly within the next 35–50 yr, reaching levels comparable both to present total energy consumption and to future maximum fossil-fuel use. The transition from fossil to non-fossil sources must be well under way within this period (Fig. 5).

(4) The lower the CO₂ limit, the earlier must be the time to begin to reduce fossil fuel use. To achieve a concentration limit of 500 ppmv, vigorous action would have to be effective within the next 10–20 yr; for a limit of 600 ppmv, less strenuous action would need to become effective in 20–30 yr. If growth in energy demand proves to be much less than the IIASA Low Scenario, then the urgency for actions either explicitly to restrict fossil-fuel use or to promote the introduction of non-fossil sources would be substantially reduced.

These conclusions lead us to believe that U.S. energy policy should not be neutral with respect to the CO₂ issue. We see the need at least for the following:

(1) An aggressive research program to improve our understanding of CO₂ effects and reduce uncertainty.

(2) International cooperation to develop a world energy strategy, including understandings as to what actions might be taken to limit CO₂.

(3) Encourage development and improvement of non-fossil energy technologies which could contribute in a major way to satisfy total world energy needs. These are principally solar and nuclear systems; we believe that their present well-documented difficulties can be much alleviated. If that comes to pass, a combination of both is likely to be needed.

(4) Encourage more efficient use of energy sources world wide, which will provide more time to understand the CO₂ problem and/or ease the severity of the needed response to curtail fossil fuels.